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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,921	05/04/2005	Priyadarshi Gautam Desai	1415 US/PCT	6081

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EXAMINER	
HEVEY, JOHN A	

ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/533,921	DESAI ET AL.	
	Examiner	Art Unit	
	JOHN A. HEVEY	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/4/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Application

Claims 1-17 are cancelled. New claims 18-34 are pending and presented for examination.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 18 and 20-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Desai et al. (US6475426).

The applied reference has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

In regards to claim 18, Desai teaches a resin-bonded refractory comprising 50-90 wt% refractory aggregate, 1-10 wt% binder and 0.5-15% reactive metal (see claim 6). Although the reference does not disclose the permeability, it teaches an anticipatory composition and specific embodiments such as 86 wt% refractory aggregate, 4 wt% binder and 6 wt% reactive metal, 4 wt% graphite, and 2 wt% alumina (see Table 1) and therefore would inherently possess the same properties as the composition required by claim 18.

In regards to claim 20, Desai teaches a refractory aggregate comprises at least one selected from the group consisting of alumina, zirconia, calcia, magnesia, silica, and mixtures and compounds thereof (see claim 7).

In regards to claim 21, Desai teaches a resin-bonded refractory mixture comprising a boron compound (see claim 8) and a carbide (see claim 9).

In regards to claim 22, Desai teaches a resin-bonded refractory article comprising a reactive metal selected from the group consisting of aluminum, magnesium, silicon, titanium, and mixtures and alloys thereof (see claim 12).

In regards to claim 23, Desai teaches the use of phenolic compounds, starch, or lignosulfinate as a binder (see col. 4, lines 55-57).

In regards to claims 24-25, Desai teaches the addition of organic material capable of increasing permeability during heating such as a carbonaceous binder derived from pitch or resin (see col. 4, lines 51-55).

Claim 26, dependent on claim 18, is drawn to a permeable material composition. The statement "characterized by the permeable material lining at

least an inner surface of a refractory nozzle for use in the casting of molten metal" and following limitations are regarded as statements of intended use.

Therefore, claims 26-34, which recite limitations drawn to a nozzle comprising an inner and outer surface are all drawn to subject matter regarded as intended use and do not carry patentable weight.

Desai suggest a refractory material capable of lining a refractory nozzle (see for example claims 1 and 11) and therefore meet the requirements of claims 26-34.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 18-21 and 23-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeda et al. (US6281266) in view of Hall et al. (US5137189).

Claim 18 is drawn to a permeable material comprising a refractory aggregate, 0.5-15 wt% of at least one oxygen getter, and a binder, said material having a permeability of at least about 50 cD.

Takeda et al. (Takeda) teaches a taphole plugging composition comprising a refractory aggregate, graphite, silicon nitride, a refractory clay, and a binder comprising phenolic resin, a ketone compound and a pitch, and an organic fine fiber (see col. 2, lines 45-51) wherein said graphite and silicon nitride is parts of 5-30% by weight (see col. 4, lines 19-21). Takeda teaches said composition should have high permeability and porosity (see col. 1, lines 37-39) but does fails to teach the specific permeability of the composition.

Hall et al. (Hall) teaches a porous refractory material for contact with molten metal, comprising a ceramic oxide such as alumina, silica, magnesia, calcia, or zirconia with a porosity of 20-30% and a permeability of 500-1500 cD (see col. 4, lines 1-14). Hall teaches an example comprising 91% alumina and about 8% silica with a porosity of 24% and permeability of 1000 cD (see col. 4, lines 1-14).

It would have been obvious to one of ordinary skill in the art to modify the composition taught by Takeda to have a permeability of at least 50 cD. One of ordinary skill in the art would recognize that both references teach a exemplary compositions comprising of over 80% alumina aggregate and having porosities between 20-30%. Thus, it would have been obvious to one of ordinary skill in the art to make a composition as taught by Takeda, having a permeability of greater

than 50 cD, as taught by Hall, motivated by the need for a highly permeable material compatible with molten metal contact.

In regards to claim 19, Takeda teaches said refractory aggregate in 60-85% by weight (see col. 4, lines 11-25, and claim 6) and having a maximum particle size of 5 mm (equivalent to approx. 4 mesh). The reference teaches an example in which 50% of refractory aggregate particles are .125-3.4 mm in size (see Table 2) and others such as comparative examples 1, 2, and 8 having larger sized refractory particles. The ranges taught by Takeda overlap with the ranges required by claim 19. It would have been obvious to one of ordinary skill in the art, to select from the overlapping ranges. Overlapping ranges have been held to establish *prima facia* obviousness. See MPEP 2144.05.

In regards to claim 20, Takeda teaches said refractory aggregate is at least one selected from alumina, high alumina, silicon carbide, bauxite, mullite, chamotte, pyrophyllite, coke, zirconia, ferrosilicon and magnesia (see claim 2).

In regards to claim 21, Takeda teaches 5-30 wt% of graphite and silicon nitride (see col. 4, lines 11-24). It would have been obvious to one of ordinary skill in the art, to select from the overlapping ranges. Overlapping ranges have been held to establish *prima facia* obviousness. See MPEP 2144.05

In regards to claim 23, Takeda teaches a binder composition comprising phenolic resin, a ketone compound, and a pitch (equivalent to a carbonaceous binder)(see col. 4, lines 26-28).

In regards to claims 24-25, drawn to a fugitive additive, the reference teaches a composition including an organic fine fiber (see col. 2, line 51) which is equivalent to the fugitive additive comprising an organic compound as required by claims 24-25.

Claim 26, dependent on claim 18, is drawn to a permeable material composition. The statement "characterized by the permeable material lining at least an inner surface of a refractory nozzle for use in the casting of molten metal" and following limitations are regarded as statements of intended use.

Therefore, claims 26-34, which recite limitations drawn to a nozzle comprising an inner and outer surface are all drawn to subject matter regarded as intended use and do not carry patentable weight.

Takeda in view of Hall suggest a permeable material capable of lining a refractory nozzle (see for example Hall claim 1) and therefore meet the requirements of claims 26-34.

4. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeda et al. (US6281266) in view of Hall et al. (US5137189) as applied to claims 18-21 above, further in view of Hanse et al. (US5691061).

Takeda teaches the use of silicon carbide and silicon nitride (see above) but fails to teach the use of metallic aluminum, silicon, or titanium. Hanse et al. teaches the use of up to 5 wt% metallic additives to a refractory material used to line a channel for pouring molten steel (see claim 1), wherein said metallic

additive is silicon (see col. 3, lines 36-45). It would have been obvious to one of ordinary skill in the art to modify the teachings of Takeda in view of Hall to include a reactive metal as required by claim 22. One would have been motivated to make such a modification to create a layer of reduced permeability upon oxidation, when said permeable material is used to line a channel or nozzle (see Hanse col. 3, lines 36-45).

Conclusion

All claims have been rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN A. HEVEY whose telephone number is (571)270-3594. The examiner can normally be reached on Monday - Friday 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerry A Lorengo/
Supervisory Patent Examiner, Art Unit 1793

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